

## **ABSTRACT**

A base station apparatus and method for estimating a velocity of a mobile station in a mobile communication system are provided. In the apparatus  
5 and method, a channel estimator receives a signal on a radio channel from the mobile station and performs channel estimation using the received signal. A velocity estimator detects a power spectrum value of the channel estimator, and provides the channel estimator with a channel estimation coefficient for use during channel estimation according to a Doppler shift frequency value of power  
10 estimated from the mobile station when the velocity of the mobile station is unchanged.